



PHD OFFER

in the framework of the Chair AWESOME

(mAnufacturing of neW gEneration Sustainable and therMoplastic coMpositEs)

Title : Development of Thermoplastic Automated Tape Placement process considering photopolymerization possibilities

The development of thermoplastic composite materials and their processing is a challenge for the years to come, indeed the possibilities offered by these materials are without appeal since they offer an incredible ratio mechanical performance on density, moreover they can very easily be endowed with particular properties, multiple functionalities, and even gradient properties in a wide range of areas, as well offer the possibility of being recycled.

All these aspects make for sure thermoplastic composite materials the materials of tomorrow.

However today, although applications using these materials are more and more numerous, they are not up to what could be expected, neither in quantity nor quality, with production rates that are often limited. In addition, the proposed applications are quite specific and it seems rather difficult to adapt an existing production to another material for example or conversely for the same material, easily change the geometry of a part or its forming process chain.

The origins may be summarized in: (i) the cost, (ii) the difficulty of implementation. It is for example, difficult to organize a customized production while controlling costs. As it is difficult to master a production that unusually concentrates very varied physics, at multiple scales, which can have dramatic impacts on the quality of the parts. Moreover, at all scales of the product and at all stages of implementation, the uncertainty about the quality of the material, the part and the process is omnipresent. All these sources add up and feed the difficulty of implementation.

The AWESOME Chair (mAnufacturing of neW gEneration Sustainable and therMoplastic coMpositEs) – ARKEMA / CANOE / UPPA- offers an unexpected framework since it brings together quality partners with broad and varied skills with regard to the multi-disciplinary nature of the problem. Each partner being equipped with complementary technological platforms and innovative characterizations techniques, going from the matter at its molecular scale, to the part even at high production rate, and covering modeling, engineering, simulation and data scopes, to face an advanced and smart application that focus at more exploiting the possibilities offered by composite materials, and in this sense in break with the productions of composite parts currently existing.



Key Words:

Modeling Multiphysics

surfaces, topography, rheology of composite prepreg, consolidation process

Wave / matter interactions. Thermoplastic composites.

Thermal instrumentation / thermal modeling

Activities:

multiscale approach, numerical simulation (75%)

experimental work (device design, measurements in process real conditions) (25%)

Skills : curious, and autonomous, fluent english/french, like teamwork

Type of contract : PhD 36 months from November 2020

Gross Salary : 1758.55€/months including 32h of teaching per year.

Location : IPREM UPPA \ Pau.

Application :

- CV
- Cover letter detailing the candidate's motivations and interest in the scientific aspect of the job.
- 2 recommendation letters

Applications should be sent before August 31st at the contact email address.

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